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United States Government

Department of Energy

memorandum

Carlsbad Field Office
Carlsbad, New Mexico 88221

DATE: April 26, 2004

REPLY TO ATTN OF: CBFO:QA:MN:GS:04-0099:UFC 2300.00

SUBJECT: Audit Report A-04-12, INEEL, Advanced Mixed Waste Treatment Project Audit of Additional Characterization Activities and Transportation Activities Re-certification

TO: Brian Edgerton, DOE-ID

The Carlsbad Field Office (CBFO) conducted an audit of the Idaho National Engineering and Environmental Laboratory (INEEL), Advanced Mixed Waste Treatment Project (AMWTP) additional characterization activities and the re-certification of transportation activities. The audit was conducted on April 12-15, 2004. The audit team concluded that overall, the AMWTP implementing procedures are adequate relative to the flow-down of requirements. The audit team determined that the AMWTP technical requirements are being satisfactorily implemented and are effective in all areas except as documented in the audit report. The audit team concluded that overall, the AMWTP procedures adequately address program requirements. The audit team also determined that overall; the AMWTP program is satisfactorily implemented and is effective. The CBFO audit report is attached. As a result of the audit, one CBFO corrective action report (CAR) was forwarded under separate cover.

If you have any questions or comments, please contact me at (505) 234-7483.

Martin P. Navarrete
Quality Assurance Specialist

RECEIVED

Attachment

cc: w/attachment
A. Holland, CBFO *ED
K. Watson, CBFO *ED
A. Dobson, BNFL *ED
E. Dumas, BNFL *ED
E. Schweinsberg, BNFL *ED
M. Eagle, EPA *ED
E. Feltcorn, EPA *ED
R. Joglekar, EPA *ED
B.Shroff, EPA *ED
S. Zappe, NMED *ED
S. Holmes, NMED *ED
S. Webb, EEG *ED
D. Winter, DNFSB *ED
S. Warren, WTS *ED
J. May, CTAC *ED
L. Greene, WRES *ED
K. Dunbar, WRES
CBFO QA File

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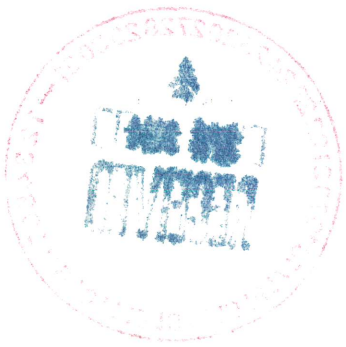

U.S. DEPARTMENT OF ENERGY
CARLSBAD FIELD OFFICE

INTERIM AUDIT REPORT

OF THE

IDAHO NATIONAL ENGINEERING AND ENVIRONMENTAL LABORATORY, ADVANCED MIXED WASTE TREATMENT PROJECT

IDAHO FALLS, IDAHO

AUDIT NUMBER A-04-12

April 12 – 15, 2004

AUDIT REPORT OF WASTE CHARACTERIZATION ACTIVITIES AND THE RE-CERTIFCATION OF TRANSPORTATION ACTIVITIES

CTI Headspace Gas Sampling and Analysis System

Prepared by: _____ **Date:** 4/21/04
Jeffrey D. May, CTAC
Audit Team Leader

Approved by: _____ **Date:** 4/26/04
Ava L. Holland, CBFO
Quality Assurance Manager

EXECUTIVE SUMMARY

Carlsbad Field Office (CBFO) Audit A-04-12 was conducted to evaluate the adequacy, implementation, and effectiveness of the technical processes of the Idaho National Engineering and Environmental Laboratory (INEEL) Advanced Mixed Waste Treatment Project (AMWTP) transuranic (TRU) waste characterization activities as they relate to the addition of the Consonant Technologies, Inc. (CTI) headspace sampling system for Summary Category Group S3000 (solids) waste. This audit also evaluated the continuing AMWTP TRU waste shipping and transportation activities.

The audit was conducted at the AMWTP facility April 12 through 15, 2004. The audit team concluded that the overall adequacy of the AMWTP technical and quality assurance (QA) programs, as applicable to audited activities, was satisfactory in meeting the flow-down of requirements from the CBFO Quality Assurance Program Document (QAPD), Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (HWFP), the Contact-Handled Transuranic Waste Acceptance Criteria (CH-WAC), TRUPACT-II Safety Analysis Report for the TRUPACT-II Shipping Package, Safety Analysis Report for HalfPACT Shipping Package, Contact Handled Transuranic Waste Authorized Methods for Payload Control (CH TRAMPAC), and CH Packaging Program Guidance.

The audit team also concluded that the defined QA and technical programs for these activities, except for the areas identified in this report, were being implemented in accordance with the applicable requirements documents and the applicable implementing procedures, and that the processes were effective.

The audit team identified three conditions adverse to quality (CAQs) resulting in the issuance of one CBFO corrective action report (CAR) that requires corrective actions in the area of transportation. Two isolated deficiencies requiring only remedial corrective actions were corrected during the audit (CDA). Three Observations were identified and three Recommendations are being offered for AMWTP management consideration. The CAR, CDAs, Observations, and Recommendations are described in Section 6.0.

SCOPE AND PURPOSE

2.1 Scope

The audit team evaluated the adequacy, implementation, and effectiveness of the technical processes of AMWTP TRU waste activities as they relate to the addition of the CTI headspace sampling system for S3000 (solids) waste. All other characterization technical elements and the complete QA program were evaluated during AMWTP Certification Audit A-03-05, performed August 19-21, 2003, and certified on March 9, 2004, and therefore were not included in this audit. This audit also evaluated the continuing AMWTP TRU waste shipping and transportation activities.

The following CBFO QA elements, as they pertain to the new HSG system and transportation, were audited:

Quality Improvement
Personnel Qualification and Training
Documents and Records

The complete QA program was audited during the AMWTP Certification Audit A-03-05 performed August 19-21, 2003, and certified on March 9, 2004, and therefore was not included in this audit.

The following characterization technical elements as they pertain to the new Headspace Gas Sampling and Analysis (HGAS S&A) system were audited:

CTI Headspace Gas Sampling & Analysis for S3000 (solids)
Project-level Data Verification and Validation
Performance Demonstration Program (PDP)
Applicable sections of the Waste Analysis Plan (WAP), Section B6

All other characterization technical elements were audited during the AMWTP Certification Audit A-03-05, performed August 19-21, 2003, and certified on March 9, 2004, and therefore were not included in this audit.

The following Transportation technical elements were evaluated:

Payload container certification
Payload container closure
WWIS entry/certification
Radiological surveys
Payload assembly
Payload loading
TRUPACT-II operations/maintenance
TRUPACT-II leak testing
Measuring and Test Equipment (M&TE)
Spare parts control
Labeling and placarding
Transportation Tracking and Communication (TRANSCOM) system
Review documentation for certification, payload assembly, TRUPACT-II loading and shipment

2.2 Purpose

The audit team evaluated the adequacy, implementation, and effectiveness of the AMWTP TRU waste characterization activities for the new CTI Headspace Gas Sampling & Analysis for S3000 (solids). In addition, the AMWTP transportation program was evaluated for re-certification.

AUDIT TEAM AND OBSERVERS

AUDITORS/TECHNICAL SPECIALISTS

Jeff May	Audit Team Leader/CBFO Technical Assistance Contractor (CTAC)
Dee Scott	Auditor/CTAC
BJ Verret	Technical Specialist/CTAC
Joe Willis	Technical Specialist/Washington TRU Solutions (WTS)
Todd Sellmer	Technical Specialist/WTS

OBSERVERS

Steve Holmes	New Mexico Environment Department (NMED)
Tally Jenkins	Department of Energy, Nuclear Energy, Idaho Operations (DOE-NE-ID)
James Wolski	DOE-NE-ID

4.0 AUDIT PARTICIPANTS

AMWTP individuals involved in the audit process are identified in Attachment 1. A pre-audit meeting was held at the AMWTP facilities in Idaho Falls, Idaho, on April 12, 2004. Daily meetings were held with AMWTP management and staff to discuss issues and potential deficiencies. The audit concluded with a post-audit meeting held at the AMWTP facilities in Idaho Falls, Idaho, on April 15, 2004.

SUMMARY OF AUDIT RESULTS

Program Adequacy, Implementation, and Effectiveness

The audit team concluded that the applicable AMWTP TRU waste characterization and transportation activities, as described in the associated AMWTP implementing procedures, satisfactorily meet the applicable requirements. Overall, the AMWTP implementing procedures and technical processes evaluated by the audit team were determined to be adequate, satisfactorily implemented, and effective.

Attachment 2 contains a list of AMWTP procedures included in the audit and Attachment 3 contains a summary table of the audit results. Audit activities, including objective evidence reviewed, are described below and in CBFO checklists and/or objective evidence review forms.

Technical Activities

The following sections describe the technical activities reviewed during the audit.

5.2.1 Project-level Data Validation and Verification

The audit team evaluated the project-level data V&V process and examined three data packages, HS404-00025, HS404-00042 and HS104-00045, for the CTI Headspace Gas Sampling and Analysis System, including the verification of the generation-level reviews and project-level reviews. The audit team examined the batch data reports (BDRs) to determine whether the data quality objectives (DQOs) and activities of the Site Quality Assurance Officer (SQAO) and Site Project Manager (SPM) were being satisfactorily carried out. The audit team also determined that there was no non-administrative nonconformance reports (NCRs) generated at the SPM level that would have required CBFO notification.

The audit team identified no conditions adverse to quality in this area; therefore no CARs were issued and no CDAs occurred. The audit team did not find any areas that warrant the issuance of Observations or Recommendations, therefore none were made. The audit team concluded that project-level V&V was adequate, satisfactorily implemented, and effective.

5.2.2 CTI Headspace Gas Sampling and Analysis

The audit team evaluated the HGAS S&A activities and hydrogen and methane analysis activities performed on the new AMWTP CTI HGAS S&A instruments from April 12 through April 14, 2004. The audit team reviewed Procedures INST-OI-43, *HGAS Sampling and Analysis Operations*, MP-TRUW-8.8, *Level I Data Validation,* and MP-TRUW-8.9, *Level II Data Validation*, for adequacy. The procedures meet the requirements of the WIPP WAP and the associated Environmental Protection Agency (EPA) SW-846 procedures.

AMWTP demonstrated HGAS S&A and hydrogen and methane analysis activities on April 13, 2004. Instrument tuning samples, QA samples, and actual drum samples were sampled and analyzed. The instruments at AMWTP were examined and determined to meet the requirements for identical systems. Hydrogen and methane analyses are conducted simultaneously with HGAS analysis and the data are reported on the same forms as HGAS data.

Three HGAS S&A data packages, HS404-00025, HS404-00042, and HS104-00045, were examined during the audit. Analytical standard certificates of analysis, measuring and test equipment certifications, initial calibrations, detection limits, and method performance standard results were evaluated. Interviews were conducted with staff members and individual qualifications and training were verified. The same chemists and operators who perform headspace gas analysis perform hydrogen and methane analysis. Records transmittal and storage were checked. Successful participation in the most recent Performance Demonstration Program HGAS cycle (Cycle 18A) was verified.

No conditions adverse to quality (CARs or CDAs), Observations, or Recommendations were noted in this area during the evaluation of the HGAS S&A activities and hydrogen

and methane analysis activities performed on new AMWTP CTI HGAS S&A instruments. The audit team concluded that the AMWTP procedures are adequate. The audit team also determined that the HGAS S&A activities and hydrogen and methane analysis activities are being satisfactorily implemented and are effective.

5.2.3 Transportation

The audit team evaluated the AMWTP TRUPACT-II operations personnel training, Level II Leak Tester training, payload certification, payload assembly, TRUPACT-II operations (TRUPACT-II disassembly, component inspections and cleaning, maintenance, payload loading, TRUPACT-II assembly, leak testing), spare parts procurement and material control, calibration practices, test helium certification, TRANSCOM qualification, and shipping documentation. The audit team observed AMWTP personnel disassemble TRUPACT-II Serial Number (S/N) 201 and TRUPACT-II S/N 202, inspection and cleaning of both TRUPACT-IIs, loading of a ten-drum overpack (TDOP) payload into TRUPACT-II S/N 201, closure of TRUPACT-II S/N 201 and leak testing of TRUPACT-II S/N 201 as part of AMWTP Shipment Number IN040009 to verify implementation of procedures. In addition, the audit team reviewed container tracking processes and payload certification and shipping documentation for previous AMWTP TRUPACT-II shipments.

The audit team identified three issues pertaining to the performance of maintenance on TRUPACT-IIs, which were determined to be CAQs. As a result of this determination, CAR 04-019 was initiated, combining these issues. Two CAQs were identified that were corrected during the audit and verified corrected (CDAs 1 and 2). Three Observations (Observations 1, 2, and 3) and three Recommendations (Recommendations 1, 2, and 3) were initiated during the audit.

The audit team observed excellent job control techniques by the AMWTP operations and radiological control personnel during TRUPACT-II operations and leak testing.

A Department of Energy (DOE), Idaho Operations Office, Facility Representative observed the audit team and work activities performed during TRUPACT-II operations and leak testing.

Overall, AMWTP TRUPACT-II operations, waste certification, and transportation procedures and activities were determined to be adequate, satisfactorily implemented, and effective.

6.0 CARs, CDAs, OBSERVATIONS, AND RECOMMENDATIONS

Corrective Action Reports

CARs Initiated as a Result of CBFO Audit A-04-12

CAR 04-019, briefly described below, was initiated as a result of Audit A-04-12 and has been transmitted to AMWTP under separate cover.

6.1.2.1 CBFO CAR 04-019

Contrary to the requirements of DOE/WIPP 02-3183, Sections 1.1, 5.6, and 5.7 and Work Instruction CH.01, the following conditions adverse to quality were identified.

- Maintenance records 03-087 through 03-092 have not been forwarded to the WIPP Management & Operating (M&O) contractor and are missing from the British Nuclear Fuels Limited (BNFL) TRUPACT-II Maintenance Record logbook.
- Maintenance Job Nos., 03-041, 03-042, 03-043, and 03-048 replaced the Inner Containment Vessel/Outer Containment Vessel (ICV/OCV) seal test port plugs, but failed to replace the corresponding O-rings.
- Maintenance Job Nos. 04-002 through 04-009 used an obsolete revision of the Maintenance record.

Deficiencies Corrected During the Audit (CDA)

Two deficiencies, requiring remedial action only, were identified during the audit. All were corrected and verified before the completion of the audit. These are identified on the completed audit checklists and documented on the Corrected During the Audit Forms, which are maintained as CBFO QA records. Summaries of the CDAs are provided below:

1 Packaging for part numbers 2077-160-16 (Purchase Order (PO) 44757) and 2077-180-06 (PO 400589) does not include the part description as required.

The audit team verified that BNFL confirmed with the WIPP M&O that the PO (400589) and part number (2077-180-06) on the packaging matched the part contained within. The packaging was then marked with the correct description. In addition, Parts 2077-160-16 from PO 44757 were removed from inventory, placed into a Fed Ex package, and sent to the WIPP M&O on 4/14/04. This was found to be acceptable by the audit team.

2. The release number(s) for parts procured under PO 4952 are not recorded (e.g., 4952-1, 4952-3). In addition, the spare parts quarterly inventory form lists, where applicable, the substitute part in the same row, with no distinction made as to which part the PO pertains. This makes it impossible to determine the inventory levels.

The audit team verified that BNFL revised the quarterly inventory sheets to separate primary from substitute parts. BNFL also took a new inventory and the release numbers for applicable POs were recorded. The corrected inventory will be submitted to the WIPP M&O. These actions were found to be acceptable.

Observations

The following three Observations were identified during the audit:

1. Flexible gas lines used to transmit helium gas to the helium backfill station and nitrogen gas to the nitrogen purge equipment are identical in appearance. Although one end of each line is marked using a piece of tape with an "N" for nitrogen and an "H" for helium, they could be easily switched since both lines have identical connectors and receptors. If left as is, this situation could result in the lines being switched, creating a condition adverse to quality.

2. The time frame between completion of section 4.12.6 of INST-OI-20, Rev 16, and the beginning of section 4.12.7 "Vent Port Plug Leak Test" is excessive and could lead to saturation of the vent port plug O-ring seal due to the continuous supply of helium to the front side of the O-ring seal.

3. On Form 1143 for TRUPACT-II S/N 201, step 4.12.6.4, the leak test operator miscalculated the leak rate by a magnitude of 10 ($.426X10^{-8}$ verses $.426X10^{7}$). Although the leak rate recorded was acceptable ($.426X10^{-7}$), it appears the operator is not familiar with the use of scientific notation while calculating leak rates. Incorrect use of scientific notation is prevalent throughout this form. It should be noted that this form was reviewed for completeness and accuracy and was signed off as correct.

Recommendations

The following three Recommendations were presented for AMWTP management consideration:

1 The test string used to connect the Mass Spectrometer Leak Detector (MSLD) to the test line is not conducive to good vacuum practice. Several threaded connections make up the test string. Because this test string is in the immediate location of the helium back fill system, it could easily contribute to a "false" high helium background reading that could affect the outcome of the pre-shipment leak test.

It is recommended that the current test string be replaced with a 90-degree elbow with an O-ring compression fitting.

2. The following concerns and recommendations pertaining to the performance of Procedure INST-OI-20, Rev 16 are being offered for management consideration.

   During performance of step 4.8.4.1 of INST-OI-20, Rev 16, a pointed metal tool was used to remove the main O-rings, which could scratch the seal surface causing leak test failure and the necessity for repair of the unit.

   It is recommended that a plastic or wooden tool be used to remove the O-rings.

   During performance of step 4.8.6.4 of INST-OI-20, Rev 16, the main O-ring grooves were inspected for scratches; however, this inspection was not performed as thoroughly as it should have been.

   It is recommended that these inspections be performed more diligently and that supplemental lighting be used during the inspections.

   During performance of step 4.9.20 of INST-OI-20, Rev 16, the positions of the counter weights were marked, but the applicable counter weights associated with the marked positions (i.e., 041°/275°) were not identified.

   It is recommended that the counter weight number be recorded next to the corresponding position on the tag placed on the payload.

   Step 4.12.3.1.17.1 of INST-OI-20; Rev 16, currently does not instruct the leak test operator to verify the temperature adjusted leak rate is accurate if adjustment to the "zero" control is necessary.

   It is recommended that this step be modified to read, "Then return to steps 4.12.3.1.11.1 through 4.12.3.1.17"

   Step 4.12.7.8 of INST-OI-20, Rev 16, allows the technician to clean the test tool with alcohol immediately prior to use. During cleaning, the O-ring on the tool is also wiped with alcohol. This removes the required lubrication from the O-ring, which could result in an inability to form a seal between the test tool and the test port interface.

   It is recommended this section be reworded to prevent cleaning of the threads and O-ring on the tool with alcohol.

3. AMWTP electronically segregates nonconforming items, however, nonconforming containers are not physically identified by marking, tagging, or segregation.

It is recommended that a nonconformance tag or adhesive label be attached to each nonconforming container or item upon issuance of a nonconformance.

7.0 LIST OF ATTACHMENTS

Attachment 1: Personnel Contacted During the Audit
Attachment 2: AMWTP Procedures Audited
Attachment 3: Summary Table of Audit Results

PERSONNEL CONTACTED DURING THE AUDIT				
NAME	TITLE/ORG	PREAUDIT MEETING	CONTACTED DURING AUDIT	POST AUDIT MEETING
Briggs, Mike	Training Lead/BNFL	X		
Clary, Bridget	BNFL, Doc. Control		X	
Cullison, Richard	DOE-ID			X
Dobson, A. J.	General Manager/BNFL	X		X
Dumas, Elvin	QA Manager/BNFL	X		X
Edgerton, Brian	DOE-NE-ID AMWTP Project Director	X		X
Finup, Julie	DOE-ID FR	X		
Flores, Shannon	BNFL Ops Tech.		X	
Hampton, Jeremy	BNFL Operations	X	X	X
Harrawood, Ken	BNFL Production Mgr	X		
Harris, James	RSM/OSM, BNFL	X		
Huckaba, Chuck	BNFL Sr. Training Specialist		X	
Jenkins, Talley	DOE-ID	X		X
Masulonis, John	BNFL-OPS		X	
Ochi, Gail	BNFL Training		X	
Pound, Don	WCO/TCO, BNFL	X	X	X
Provencher, Rick	DOE-ID Deputy Manger	X		X
Riley, Scott	Chemist, BNFL	X	X	X
Schweinsberg, Eric	TRU Program/BNFL	X	X	X
Shaffer, Alan	BNFL RCT		X	
Sillito, Graham	BNFL Maint Mgr.		X	
Simmons, John	BNFL Ops Tech.		X	
Stone, Ken	AMWTP TRU Programs	X		
Swale, Dave	Programs Manager, BNFL	X		X
Taft, Rod	DOE-NE-ID Ops			X
Tedford, Gina	WCO/TCO/BNFL	X	X	X
Thomas, Bill	BNFL Ops Tech.		X	
Wells, Jerry	DOE-ID	X		X
Wolski, James	NE-ID WMD		X	

AMWTP PROCEDURES AUDITED IN AUDIT A-04-12			
	Procedure Number		Procedure Title
1.	INST-OI	09	Retrieval Enclosure Waste Container Extraction
2.	INST-OI	11	Waste Container Handling
3.	INST-OI	20	TRUPACT-II Operations
4.	INST-OI	21	Payload Assembly
5.	INST-OI	43	HGAS Sampling and analysis Operations
6.	MP-CMNT	10.10	TRUPACT-II Maintenance Program
7.	MP-TRUW	8.5	TRU Waste Certification
8.	MP-TRUW	8.12	Waste Receipt and Shipping Inspection
9.	MP-TRUW	8.27	TRUCON Management
10.	MP-TRUW	8.3	TRUPACT-II Authorized Methods for Payload Control (TRAMPAC)
11.	MP-TRUW	8.6	Contact Handled Transuranic Waste Authorized Methods for Payload Control (CH TRAMPAC) for HalfPACT
12.	MP-TRUW	8.8	Level I Data Validation
13.	MP-TRUW	8.9	Level II Data Validation

SUMMARY TABLE OF AUDIT RESULTS

EVALUATED QA AND TECHNICAL ELEMENTS	Concern Classification				QA / Technical Evaluation		
	CARs	CDAs	OBSs	RECs	Program Adequacy	Effectiveness of Implementation	Effectiveness of Program
CTI Headspace Gas Sampling and Analysis for S3000 (Solids)					A	S	E
Transportation	04-019	1 & 2	1, 2, & 3	1, 2, & 3	A	S	E
SUMMARY TOTALS	1	2	3	3	A	S	E

LEGEND: CARs = Corrective Action Reports; CDAs = Corrected During the Audit; OBSs = Observations; RECs = Recommendations
ADEQUACY/EFFECTIVENESS STATEMENTS: A = Adequate; S = Satisfactory; UNSAT = Unsatisfactory; E = Effective; I = Indeterminate; M = Marginal